Dell Inspiron 660
Owner's Manual

Computer model: Inspiron 660
Regulatory model: D11M
Regulatory type: D11M002

Notes, Cautions, and Warnings

NOTE: A NOTE indicates important information that helps you make better use of your computer.

CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

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1

Before You Begin

Turn Off Your Computer and Connected Devices

CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.

1. Save and close all open files and exit all open programs.
2. Click **Start** and click **Shut Down**.

   Microsoft Windows shuts down and then the computer turns off.

   NOTE: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.
3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all telephone cables, network cables, and attached devices from your computer.
5. Press and hold the power button, while the computer is unplugged, to ground the system board.

Safety Instructions

Use the following safety guidelines to protect your computer from potential damage and ensure your personal safety.

WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

WARNING: Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

CAUTION: To avoid damaging the computer, ensure that the work surface is flat and clean.

CAUTION: To avoid damaging the components and cards, handle them by their edges and avoid touching pins and contacts.

CAUTION: Only a certified service technician is authorized to remove the computer cover and access any of the components inside the computer. See the safety instructions for complete information about safety precautions, working inside your computer, and protecting against electrostatic discharge.

CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.

CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs or thumb-screws that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending any connector pins. When connecting cables, ensure that the connectors and ports are correctly oriented and aligned.

CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Small Phillips screwdriver
- Plastic scribe
- Flash BIOS executable update program available at **support.dell.com**

2

After Working Inside Your Computer

After you complete replacement procedures, ensure the following:

- Replace all screws and ensure that no stray screws remain inside your computer
- Connect any external devices, cables, cards, and any other part you removed before working on your computer
- Connect your computer and all attached devices to their electrical outlets

△ **CAUTION: Before turning on your computer, replace all screws and ensure that no stray screws remain in the computer. Failure to do so may damage your computer.**

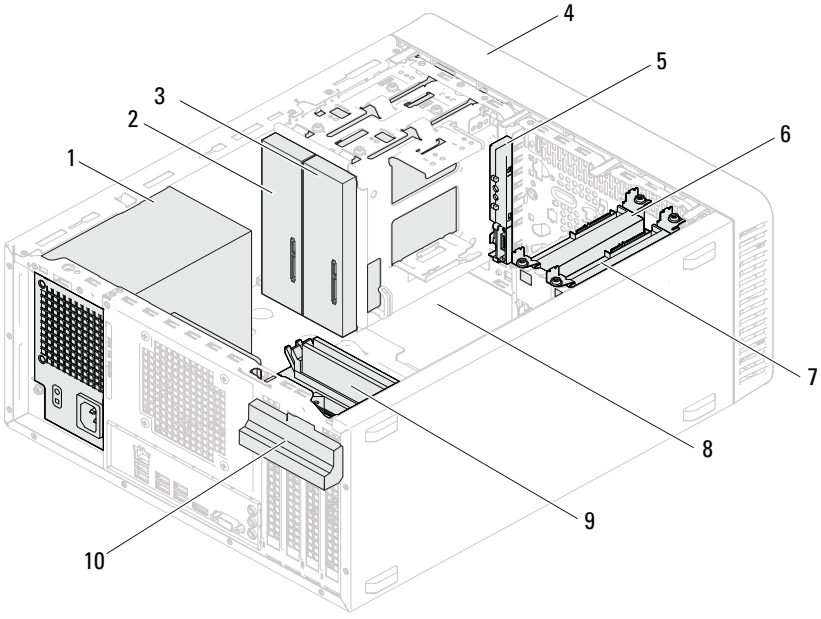
- Turn on your computer.

3

Technical Overview

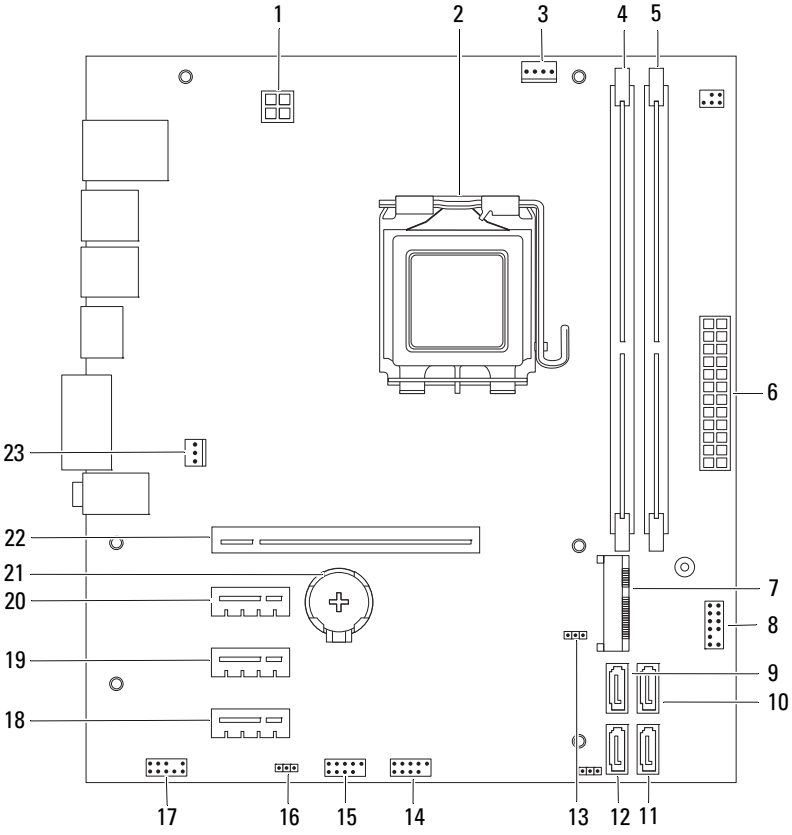
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Inside View of Your Computer



1	power supply	2	primary optical-drive
3	secondary optical-drive	4	front bezel
5	front I/O panel	6	primary hard-drive
7	secondary hard-drive	8	system board
9	memory modules	10	card retention bracket

System Board Components



1	power connector (ATX12V)	2	processor socket
3	processor fan connector (FANCPU)	4	memory-module connector (DIMM1)
5	memory-module connector (DIMM2)	6	main power connector (ATX)
7	Mini-Card slot (MINI1)	8	power button connector (LEDH2)
9	SATA connector (SATA 3)	10	SATA connector (SATA 2)
11	SATA connector (SATA 1)	12	SATA connector (SATA 0)
13	CMOS reset jumper (CMOSCLR1)	14	front panel USB connector (USBF2)
15	front panel USB connector (USBF1)	16	password reset jumper (PSWDCLR1)
17	front panel audio connector (AUDIOF1)	18	PCI Express x1 card slot (SLOT4)
19	PCI Express x1 card slot (SLOT3)	20	PCI Express x1 card slot (SLOT2)
21	battery socket (BT1)	22	PCI Express x16 card slot (SLOT1)
23	chassis fan connector (FANSYS4)		

4

Computer Cover

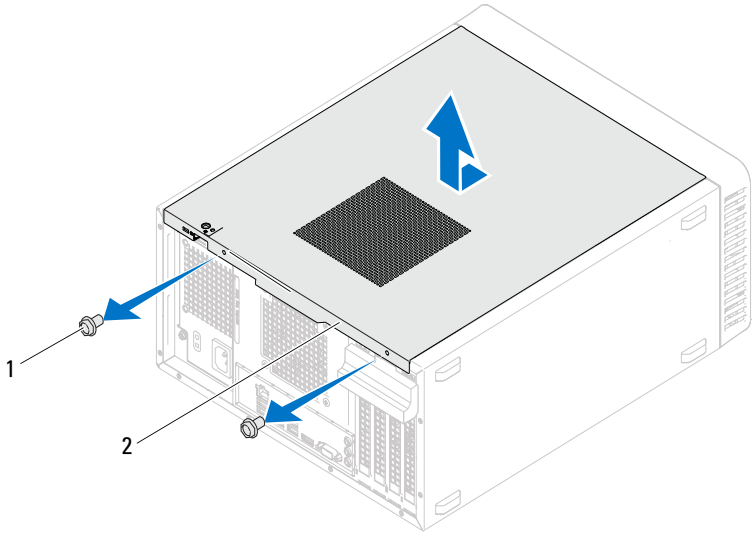
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

CAUTION: Ensure that sufficient space exists to support the computer with the cover removed—at least 30 cm (1 ft.) of desk top space.

Removing the Computer Cover

NOTE: Ensure that you remove the padlock from the padlock rings, if applicable.

1. Lay the computer on its side with the computer cover facing up.
2. Using a screwdriver, remove the screws that secure the computer cover to the chassis.
3. Release the computer cover by sliding it away from the front of the computer.
4. Lift the cover away from the computer and set it aside in a secure location.

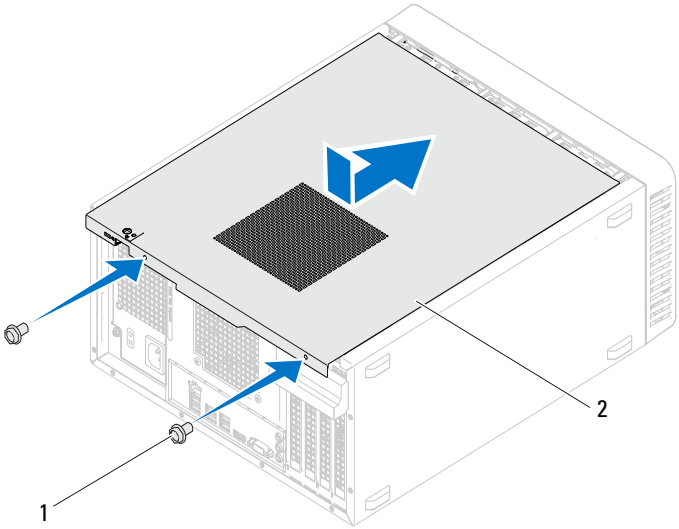


1 screws (2)

2 computer cover

Replacing the Computer Cover

1. Connect all the cables and fold the cables out of the way.
2. Ensure that no tools or extra parts are left inside the computer.
3. Align the tabs at the bottom of the computer cover with the slots located along the edge of the chassis.
4. Press the computer cover down and slide it towards the front of the computer.
5. Replace the screws that secure the computer cover to the chassis.



1	screws (2)	2	computer cover

6. Place the computer in an upright position.
7. Follow the instructions in "After Working Inside Your Computer" on page 11.

5

Memory Module(s)

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Removing the Memory Module(s)

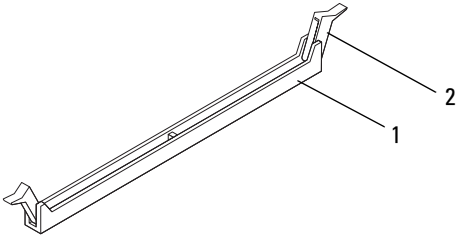
Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

Procedure

WARNING: The memory module(s) may become very hot during normal operation. Allow the memory module(s) to cool before touching them.

1. Locate the memory-module connector on the system board. See "System Board Components" on page 14.
2. Press out the securing clip at each end of the memory-module connector.
3. Grasp the memory module and pull it upwards. If the memory module is difficult to remove, gently ease the memory module back and forth to remove it from the connector.



1 memory module connector 2 securing clips (2)

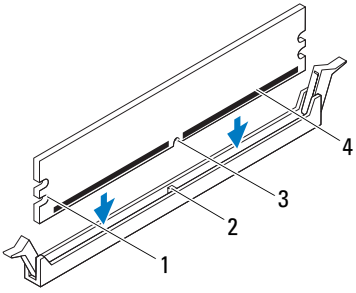
Replacing the Memory Module(s)

CAUTION: If you remove the original memory module(s) from your computer during a memory upgrade, keep them separate from any new memory module(s) that you may have, even if you purchased the new memory module(s) from Dell. If possible, do not pair an original memory module with a new memory module. Otherwise, your computer may not start properly.

CAUTION: Do not install ECC or DDR3U memory modules.

Procedure

1. Press out the securing clip at each end of the memory module connector.
2. Align the notch on the memory module with the tab in the memory module connector.

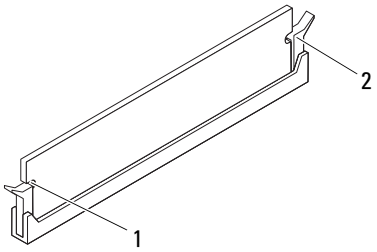


1	cutouts (2)	2	tab
3	notch	4	memory module

CAUTION: To avoid damage to the memory module, press the memory module straight down into the connector while you apply equal force to each end of the memory module.

3 Insert the memory module into the memory-module connector until the memory module snaps into position and the securing clip locks in place.

If you insert the memory module correctly, the securing clips snap into the cutouts at each end of the memory module.



1 cutouts (2) 2 securing clips (2) (snapped in position)

Postrequisites

1 Replace the computer cover. See "Replacing the Computer Cover" on page 19.

2 Follow the instructions in "After Working Inside Your Computer" on page 11.

3 Connect your computer and devices to electrical outlets, and then turn them on.

If a message appears stating that the memory size has changed, press <F1> to continue.

Log on to your computer. To verify that the memory is installed correctly, click **Start→ Control Panel→ System**. Check the amount of memory (RAM) listed.

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Front Bezel

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

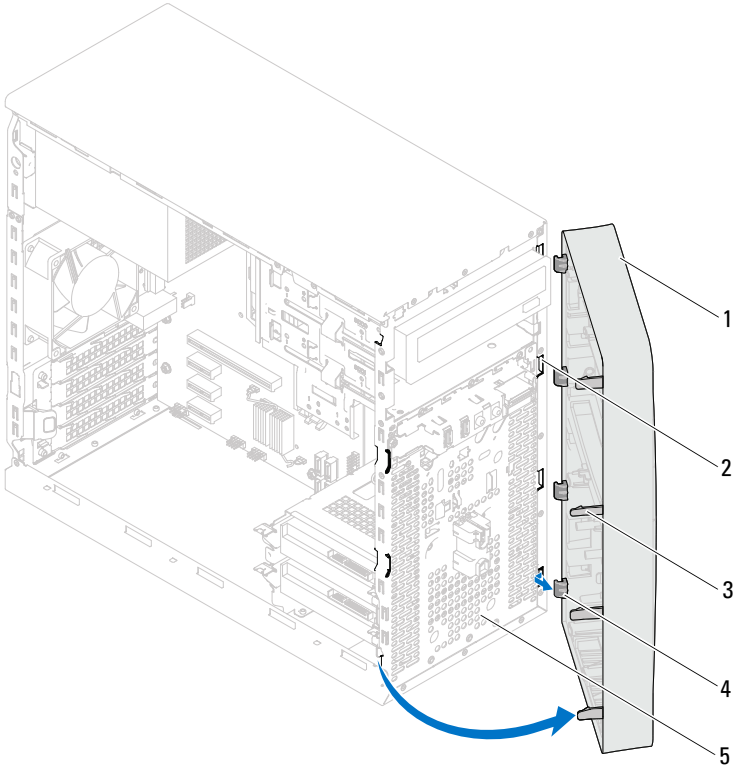
Removing the Front Bezel

Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

Procedure

1. Place the computer in an upright position.
2. Grasp and release the front bezel tabs sequentially, one at a time by moving them outward from the front panel.
3. Rotate and pull the front bezel away from the front of the computer to release the front bezel clamps from the front panel slots.



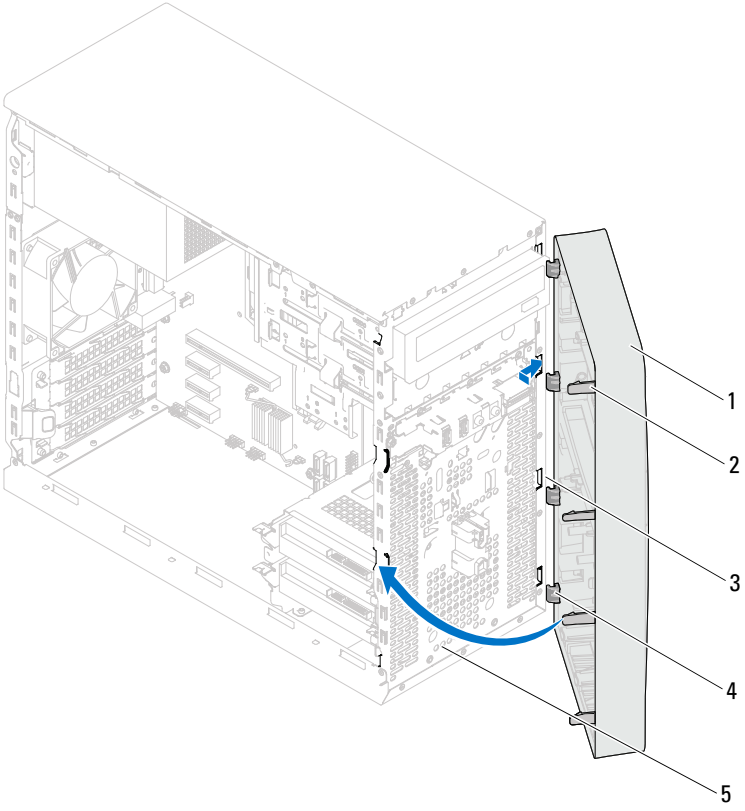
1	front bezel	2	front panel slots (4)
3	front bezel tabs (4)	4	front bezel clamps (4)
5	front panel		

4. Set aside the front bezel in a secure location.

Replacing the Front Bezel

Procedure

1. Align and insert the front bezel clamps into the front panel slots.
2. Rotate the front bezel towards the computer until the front bezel tabs snap into place.



1	front bezel	2	front bezel tabs (4)
3	front panel slots (4)	4	front bezel clamps (4)
5	front panel		

Postrequisites

1. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
2. Follow the instructions in "After Working Inside Your Computer" on page 11.

7

Card Retention Bracket

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

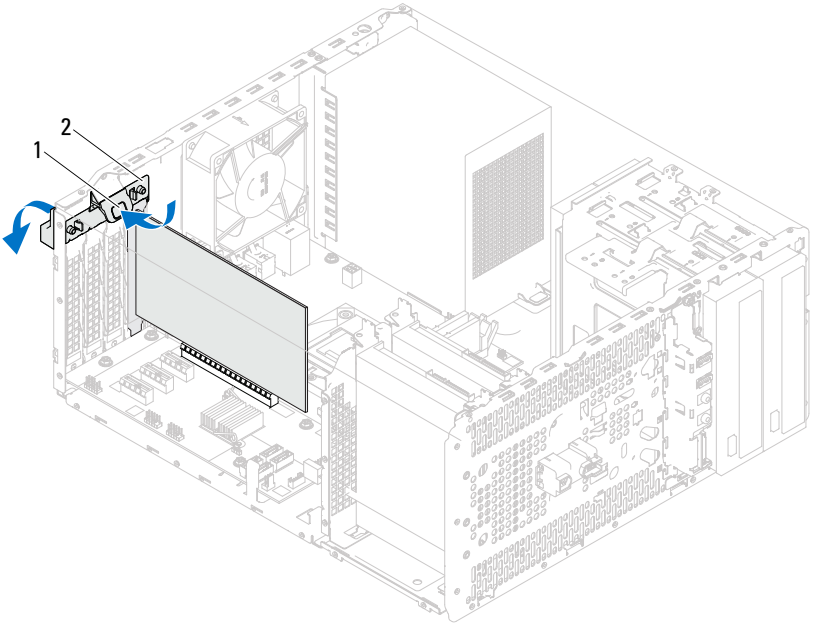
Removing the Card Retention Bracket

Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

Procedure

Push the release tab to release the card retention bracket from the chassis.



1 release tab 2 card retention bracket

Replacing the Card Retention Bracket

Procedure

Rotate and push the card retention bracket towards the computer until it snaps into place.

Postrequisites

1. Replace the computer cover. See "Removing the Computer Cover" on page 18.
2. Follow the instructions in "After Working Inside Your Computer" on page 11.

8

PCI Express Cards

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Removing PCI Express Cards

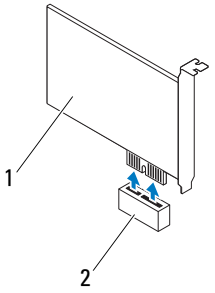
Prerequisites.

1. Remove the computer cover. See "Removing the Computer Cover" on page 18.
2. Remove the card retention bracket. See "Removing the Card Retention Bracket" on page 29.

Procedure

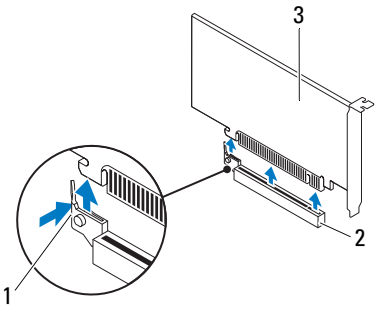
1. Disconnect any cables connected to the card, if applicable.
2. Remove the PCI Express card from the card slot:

   PCI Express x1 card — Grasp the card by its top corners, and ease it out of its connector.



1 PCI Express x1 card 2 PCI Express x1 card slot

   PCI Express x16 card — Push the securing tab to the side, grasp the card by its top corners, and then ease it out of the connector.



1 securing tab 2 PCI Express x16 card slot

3 PCI Express x16 card

3 If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

NOTE: Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

Replacing PCI Express Cards

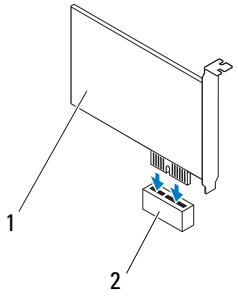
Procedure

1 Prepare the card for installation.

See the documentation that shipped with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

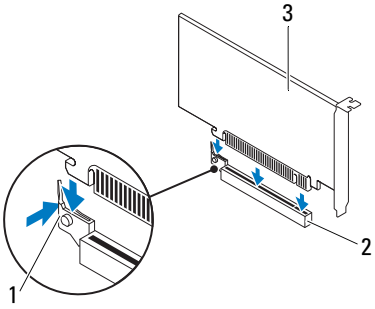
2 Replace the PCI Express card:

PCI Express x1 card — Place the PCI Express card in the slot on the system board and press down firmly. Ensure that the PCI Express card is fully seated in the slot.



1 PCI Express x1 card 2 PCI Express x1 card slot

PCI Express x16 card — Push the securing tab to the side and place the PCI Express card in the slot on the system board and press down firmly. Ensure that the PCI Express card is fully seated in the slot.



1	securing tab	2	PCI Express x16 card slot
3	PCI Express x16 card		

Postrequisites

1. Replace the card retention bracket. See "Replacing the Card Retention Bracket" on page 31.
2. Connect any cables that should be attached to the card.

   See the documentation that shipped with the card for information about the card's cable connections.

CAUTION: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

3. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
4. Follow the instructions in "After Working Inside Your Computer" on page 11.
5. To complete the installation, see "Configuring Your Computer After Removing or Installing the PCI Express Card" on page 37.

Configuring Your Computer After Removing or Installing the PCI Express Card

NOTE: For information about the location of external connectors, see the *Quick Start Guide*. For information on installing drivers and software for your card, see the documentation that shipped with the card.

	Installed	Removed
Sound card	**1** Enter system setup. See "System Setup" on page 91. **2** Go to **Onboard Audio Controller** and then change the setting to **Disabled**. **3** Connect the external audio devices to the sound card's connectors.	**1** Enter system setup. See "System Setup" on page 91. **2** Go to **Onboard Audio Controller** and then change the setting to **Enabled**. **3** Connect the external audio devices to the computer's back panel connectors.
Network card	**1** Enter system setup. See "System Setup" on page 91. **2** Go to **Onboard LAN Controller** and then change the setting to **Disabled**. **3** Connect the network cable to the network card's connector.	**1** Enter system setup. See "System Setup" on page 91. **2** Go to **Onboard LAN Controller** and then change the setting to **Enabled**. **3** Connect the network cable to the integrated network connector.

9

Mini-Card

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

CAUTION: When the Mini-Card is not in the computer, store it in protective antistatic packaging. See "Protecting Against Electrostatic Discharge" in the safety instructions that shipped with your computer.

NOTE: Dell does not guarantee compatibility or provide support for Mini-Cards from sources other than Dell.

If you ordered a wireless Mini-Card with your computer, the card is already installed.

Your computer supports one half Mini-Card slot for Wireless Local Area Network (WLAN).

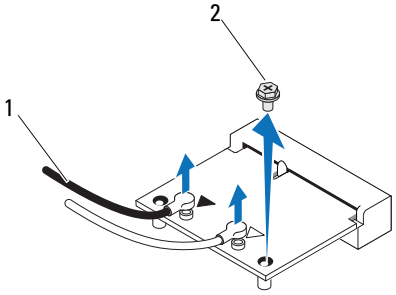
Removing the Mini-Card

Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

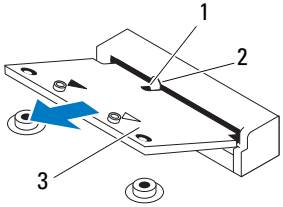
Procedure

1. Disconnect the antenna cable(s) from the Mini-Card.
2. Remove the screw that secures the Mini-Card to the system board.



1 antenna cables (2) 2 screw

3. Lift the Mini-Card away from the system-board connector.



1 notch 2 tab

3 Mini-Card

Replacing the Mini-Card

CAUTION: The connectors are keyed to ensure correct insertion. Use of excessive force may damage the connectors.

CAUTION: To avoid damage to the Mini-Card, ensure that there are no cables under the Mini-Card.

Procedure

1. Align the notch on the Mini-Card with the tab on the system-board connector.
2. Insert the Mini-Card at a 45-degree angle into the system-board connector.
3. Press the other end of the Mini-Card down into the slot on the system board and replace the screw that secures the Mini-Card to the system board.
4. Connect the appropriate antenna cables to the Mini-Card you are installing. The Mini-Card has two triangles marked on the label (black and white):
   - Connect the black cable to the connector marked with a black triangle.
   - Connect the white cable to the connector marked with a white triangle.

Postrequisites

1. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
2. Follow the instructions in "After Working Inside Your Computer" on page 11.

10

Hard Drive(s)

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

WARNING: If you remove the hard drive from the computer when the drive is hot, *do not touch* the metal housing of the hard drive.

CAUTION: To avoid data loss, do not remove the hard drive while the computer is On or in Sleep state.

CAUTION: Hard drives are extremely fragile. Exercise care when handling the hard drive.

Removing the Hard Drive(s)

Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

Procedure

1. If you are removing the primary hard-drive, disconnect the power and data cables from the primary hard-drive.
2. If you are removing the secondary hard-drive:
   a. Disconnect the power cable from the primary and secondary hard-drives.
   b. Disconnect the data cable from the secondary hard-drive.

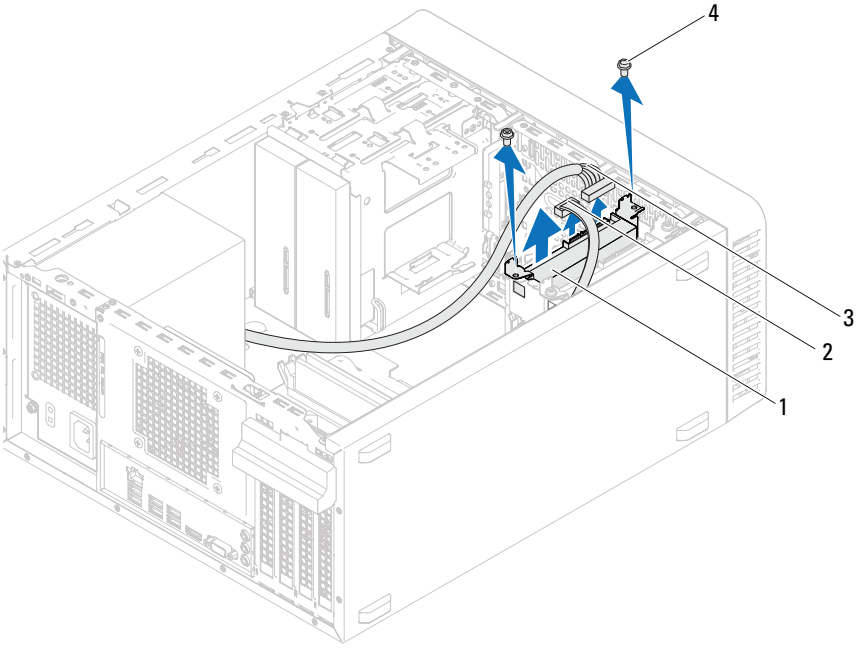
NOTE: If you are not replacing the hard drive at this time, disconnect the other end of the data cable from the system board connector and set it aside. You can use the data cable to install a hard drive at a later time.

3. Remove the screws that secure the hard-drive assembly to the hard-drive bay.

CAUTION: Ensure that you do not scratch the hard drive's circuit board, while removing or replacing the hard drive.

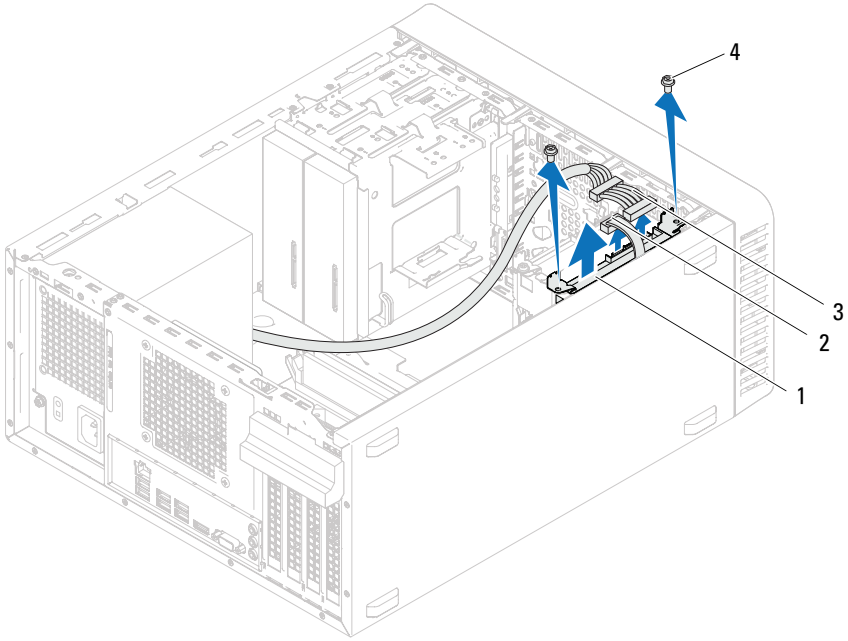
4. Lift the hard-drive assembly away from the computer.

Primary Hard-Drive



1	primary hard-drive assembly	2	data cable
3	power cable	4	screws (2)

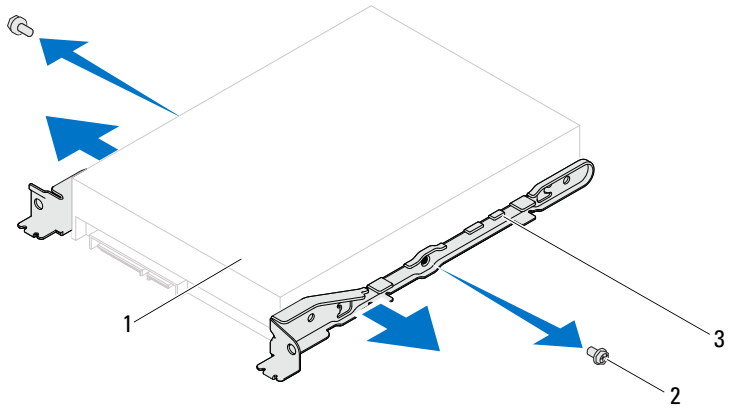
Secondary Hard-Drive



1	secondary hard-drive assembly	2	data cable
3	power cable	4	screws (2)

5 Remove the screws (one on each side) that secure the hard-drive brackets to the hard-drive.

6 Remove the hard-drive brackets off the hard drive.



1 hard drive 2 screws (2)

3 hard-drive bracket

7 If removing the hard drive changes the drive configuration, ensure that you reflect these changes in system setup. See "System Setup" on page 91.

Replacing the Hard Drive(s)

Procedure

1. Check the documentation that shipped with the hard drive to verify that it is configured for your computer.
2. Place the hard-drive brackets in position and replace the screws (one on each side) that secure the hard-drive brackets to the hard drive.
3. Slide the hard-drive assembly into the hard-drive bay.
4. Replace the screws that secure the hard-drive assembly to the hard-drive bay.
5. If you are replacing the primary hard-drive, connect the power and data cables to the primary hard drive.
6. If you are replacing the secondary hard-drive:
   a. Connect the power cable to the primary and secondary hard-drives.
   b. Connect the data cable to the secondary hard-drive.

Postrequisites

1. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
2. Follow the instructions in "After Working Inside Your Computer" on page 11.

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Optical Drive(s)

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Removing the Optical Drive(s)

Prerequisites

1. Remove the computer cover. See "Removing the Computer Cover" on page 18.
2. Remove the front bezel. See "Removing the Front Bezel" on page 25.

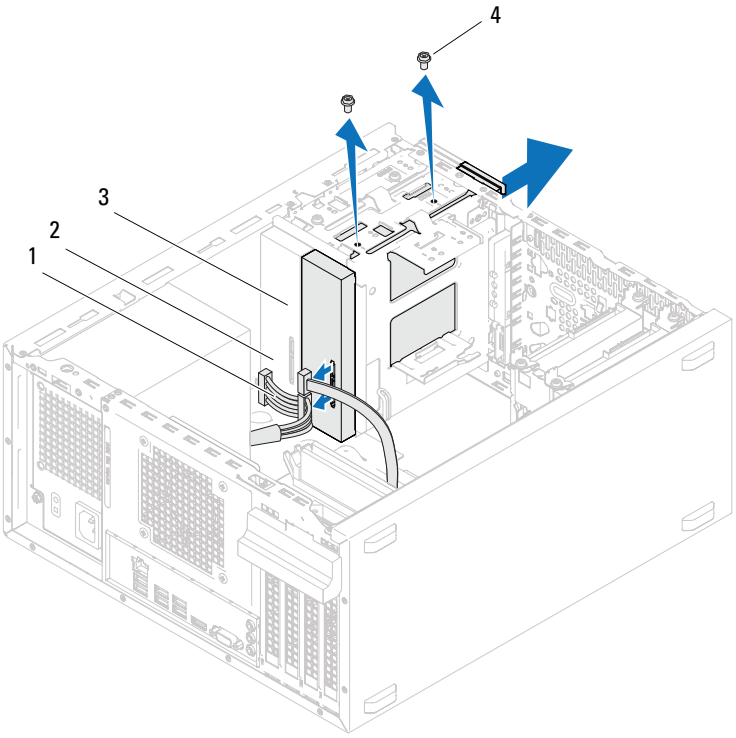
Procedure

1. If you are removing the primary optical-drive, disconnect the power and data cables from the primary optical-drive.
2. If you are removing the secondary optical-drive:
   a. Disconnect the power cable from the primary and secondary optical-drives.
   b. Disconnect the data cable from the secondary optical-drive.

NOTE: If you are not replacing the optical drive at this time, disconnect the other end of the data cable from the system board connector and set it aside. You can use the data cable to install an optical drive at a later time.

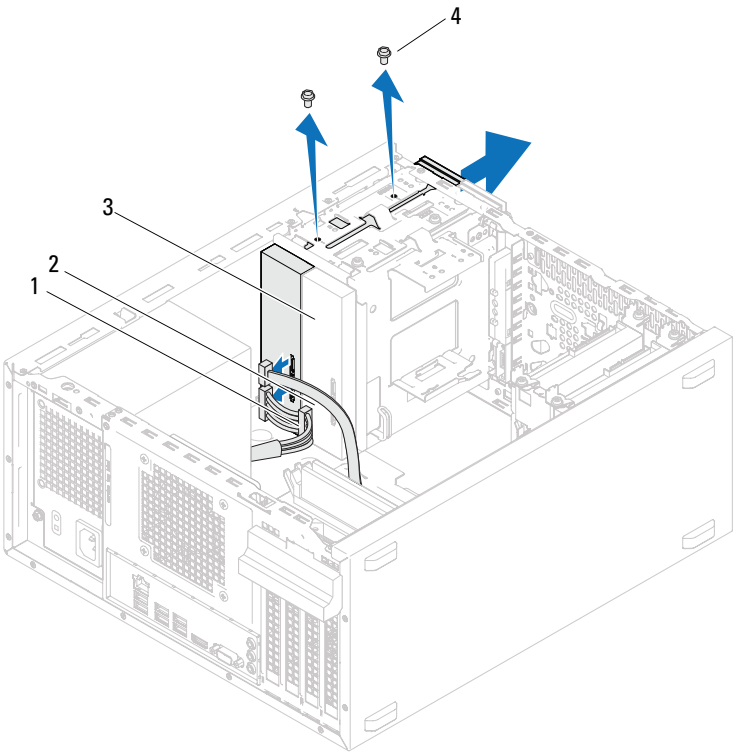
3. Remove the screws that secure the optical drive to the chassis.
4. Push and slide the optical drive out through the front of the computer.

Primary Optical-Drive



1	power cable	2	data cable
3	primary optical-drive	4	screws (2)

Secondary Optical-Drive



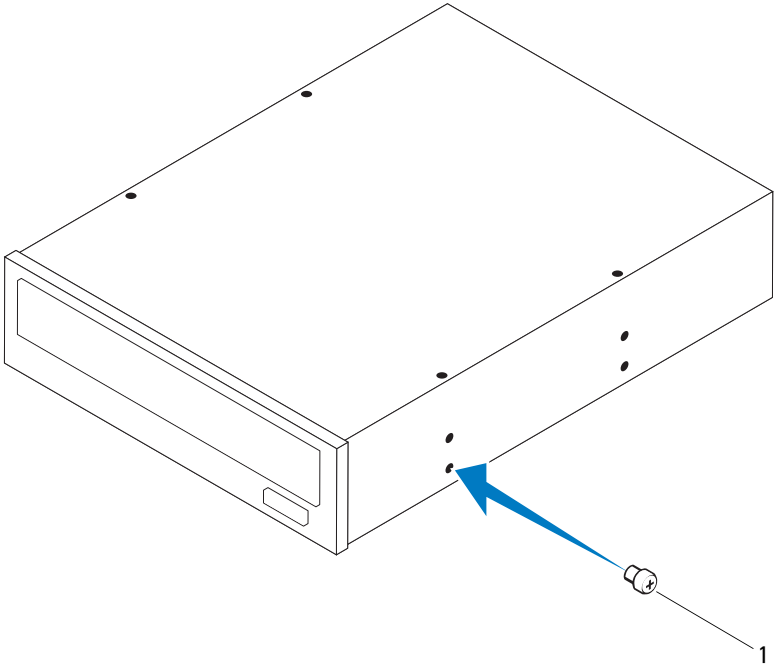
1	power cable	2	data cable
3	secondary optical-drive	4	screws (2)

5 Set aside the optical drive in a secure location.

Replacing the Optical Drives(s)

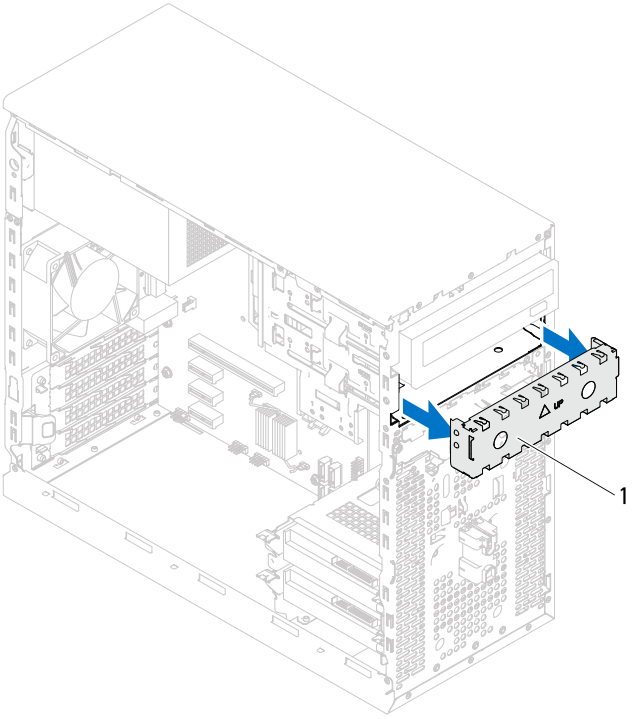
Procedure

1 Remove the screw from the optical drive you removed and insert it in the new optical drive.



1 screw

2 To install a secondary optical drive, pull the break-away metal plate off the chassis.



1 break-away metal plate

3 Gently slide the optical drive into the optical drive bay through the front of the computer.

4 Align the screw holes on the optical drive with the screw holes on the chassis.

5 Replace the screws that secure the optical drive to the chassis.

6 If you are replacing the primary optical-drive, connect the power and data cables to the primary optical-drive.

7 If you are replacing the secondary optical-drive:

   a Connect the power cable to the primary and secondary optical-drives.

   b Connect the data cable to the secondary optical-drive.

Postrequisites

1 Replace the computer cover. See "Replacing the Computer Cover" on page 19.

2 Replace the front bezel. See "Replacing the Front Bezel" on page 27.

3 Follow the instructions in "After Working Inside Your Computer" on page 11.

12

Front I/O Panel

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Removing the Front I/O Panel

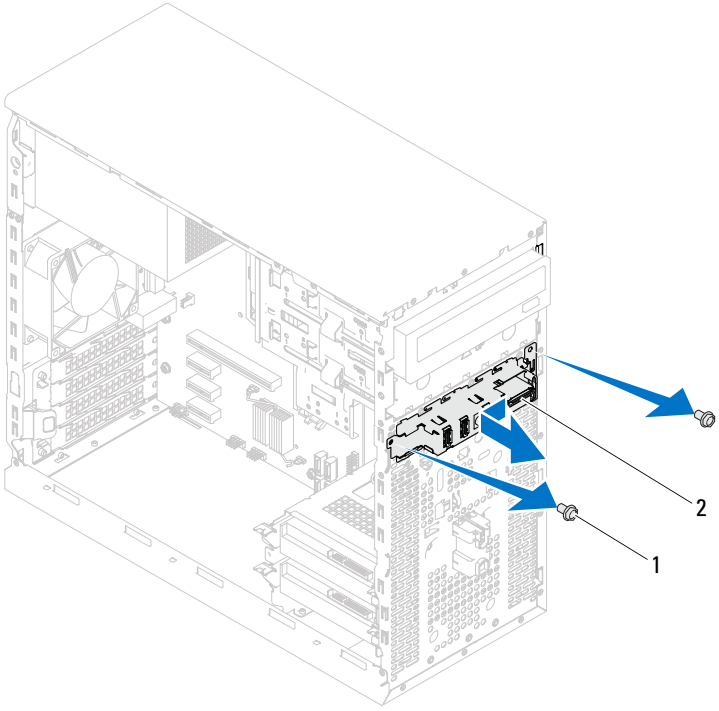
Prerequisites

1. Remove the computer cover. See "Removing the Computer Cover" on page 18.
2. Remove the front bezel. See "Removing the Front Bezel" on page 25.

Procedure

NOTE: Make note of the routing of all cables as you remove them so that you can re-route them correctly when installing the new front I/O panel.

1. Disconnect the front I/O panel cables from the system board connectors (AUDIOF1, USBF1, and USBF2). See "System Board Components" on page 14.
2. Remove the screws that secure the front I/O panel to the front panel.
3. Slide the front I/O panel towards the side as shown in the illustration to release the clamps from the front panel and pull it away.



1 screws (2) 2 front I/O panel

Replacing the Front I/O Panel

Procedure

CAUTION: To avoid damage to the cable connectors and the cable routing clips, carefully slide the front I/O panel into the front I/O panel clamp slot.

1. Align and slide the front I/O panel clamps into the slots on the front panel.
2. Replace the screws that secure the front I/O panel to the front panel.
3. Connect the front I/O panel cables to the system board connectors (AUDIOF1, USBF1, and USBF2). See "System Board Components" on page 14.

Postrequisites

1. Replace the front bezel see "Replacing the Front Bezel" on page 27.
2. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
3. Follow the instructions in "After Working Inside Your Computer" on page 11.

13

Power Button Module

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

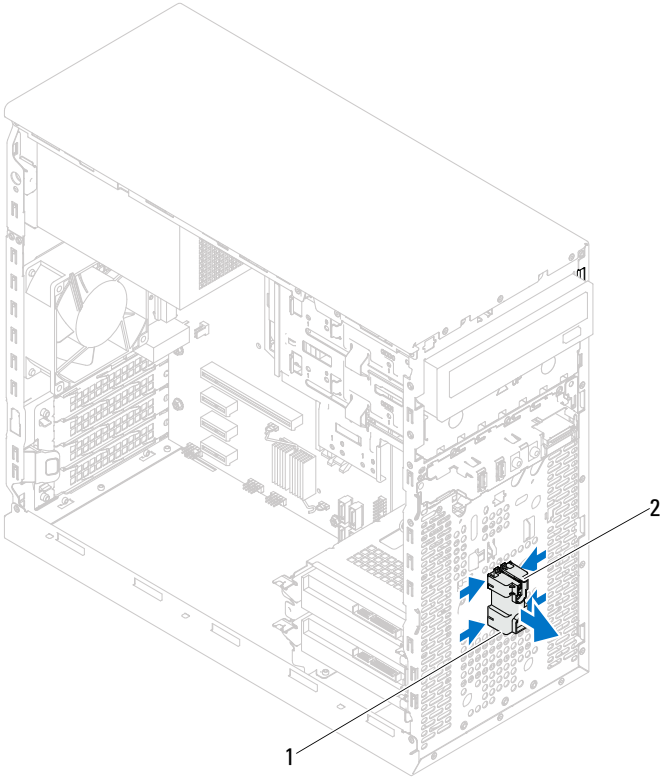
Removing the Power Button Module

Prerequisites

1. Remove the computer cover. See "Removing the Computer Cover" on page 18.
2. Remove the front bezel. See "Removing the Front Bezel" on page 25.

Procedure

1. Disconnect the power button module cable from the system board connector (LEDH2). See "System Board Components" on page 14.
2. Press the power button module tabs and pull the power button module to release it from the front panel.



1 power button module 2 power button module tabs (4)

3. Set aside the power button module in a secure location.

Replacing the Power Button Module

Procedure

1. Align and push the power button module tabs into the slots on the front panel.
2. Connect the power button module cable to the system board connector (LEDH2). See "System Board Components" on page 14.

Postrequisites

1. Replace the front bezel. See "Replacing the Front Bezel" on page 27.
2. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
3. Follow the instructions in "After Working Inside Your Computer" on page 11.

14

Chassis Fan

WARNING: Before working working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

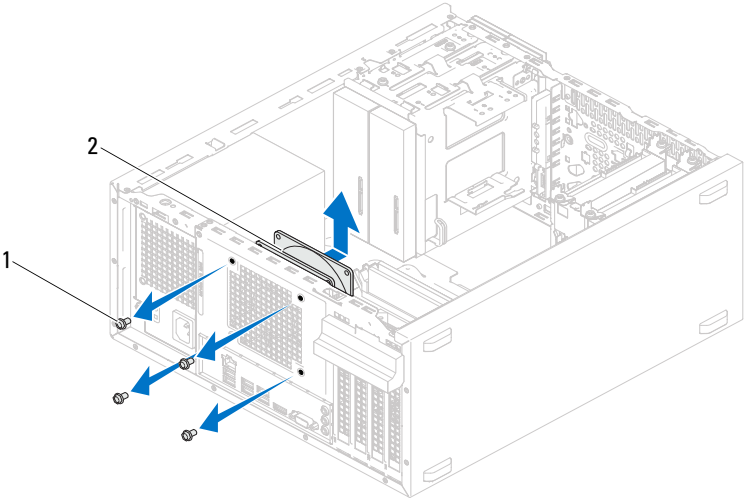
Removing the Chassis Fan

Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

Procedure

1. Disconnect the chassis fan cable from the system board connector (FANSYS4). See "System Board Components" on page 14.
2. Remove the screws that secure the chassis fan to the chassis.
3. Slide and lift the chassis fan away from the computer as shown in the illustration.



1 screws (4) 2 chassis fan

Replacing the Chassis Fan

Procedure

1. Align the screw holes on the chassis fan with the screw holes on the chassis.
2. Replace the screws that secure the chassis fan to the chassis.
3. Connect the chassis fan cable to the system board connector (FANSYS4). See "System Board Components" on page 14.

Postrequisites

Replace the computer cover. See "Replacing the Computer Cover" on page 19.

15

Processor Fan and Heat-Sink Assembly

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Removing the Processor Fan and Heat-Sink Assembly

Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

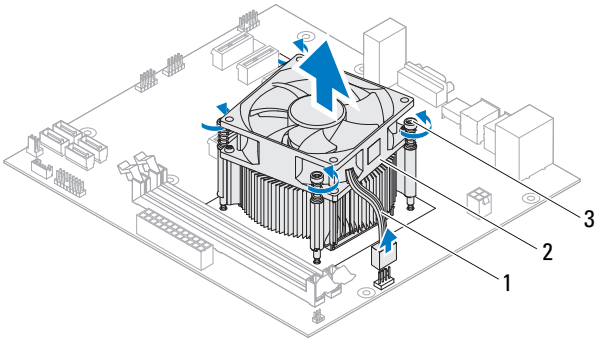
Procedure

WARNING: Despite having a plastic shield, the processor fan and heat-sink assembly may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.

CAUTION: The processor fan and heat-sink assembly is a single unit. Do not try to remove the fan separately.

CAUTION: To ensure maximum cooling for the processor, do not touch the heat transfer areas on the processor fan and heat-sink assembly. The oils in your skin can reduce the heat transfer capability of the thermal grease.

1. Disconnect the processor fan cable from the system board connector (FANCPU). See "System Board Components" on page 14.
2. Using a flat-blade screwdriver loosen the captive screws that secure the processor fan and heat-sink assembly to the system board.
3. Lift the processor fan and heat-sink assembly out of the computer.



1 processor fan cable
2 processor fan and heat-sink assembly
3 captive screws (4)

Replacing the Processor Fan and Heat-Sink Assembly

Procedure

CAUTION: Ensure that you apply new thermal grease. New thermal grease is critical for ensuring adequate thermal bonding, which is a requirement for optimal processor operation

CAUTION: Incorrect alignment of the processor fan and heat-sink assembly can damage the system board and processor

NOTE: The original thermal grease can be reused if the original processor and processor fan and heat-sink assembly are reinstalled together. If either the processor or the processor fan and heat-sink assembly is replaced, use the thermal grease provided in the kit to ensure that thermal conductivity is achieved.

1. Apply new thermal grease to the top of the processor.
2. Place the processor fan and heat-sink assembly over the processor.
3. Align the captive screws on the processor fan and heat-sink assembly with the screw holes on the system board.
4. Tighten the captive screws that secure the processor fan and heat-sink assembly to the system board.
5. Connect the processor fan cable to the system board connector (FANCPU). See "System Board Components" on page 14.

Postrequisites

1. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
2. Follow the instructions in "After Working Inside Your Computer" on page 11.

16

Processor

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Removing the Processor

Prerequisites

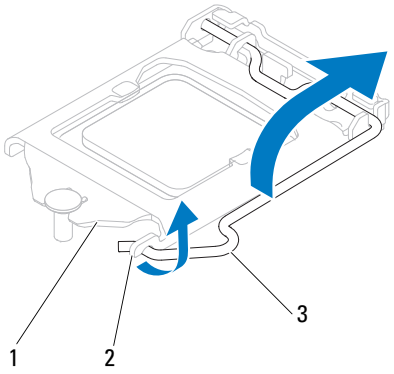
1 Remove the computer cover. See "Removing the Computer Cover" on page 18.

WARNING: Despite having a plastic shield, the processor fan and heat-sink assembly may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.

2 Remove the processor fan and heat-sink assembly from the computer. See "Removing the Processor Fan and Heat-Sink Assembly" on page 69.

Procedure

1. Press down and push the release lever away from the processor to release it from the securing tab.
2. Extend the release lever completely to open the processor cover.



1 processor cover 2 tab 3 release lever

CAUTION: When removing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

3. Open the processor cover and gently lift the processor from the processor socket.

   Leave the release lever extended in the release position so that the socket is ready for the new processor.

Replacing the Processor

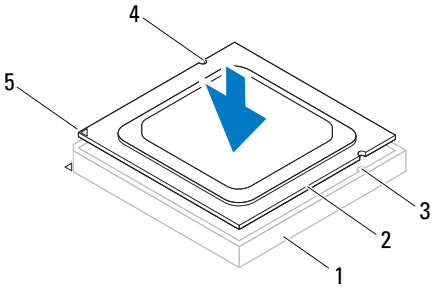
Procedure

1. Unpack the new processor, being careful not to touch the underside of the processor.

CAUTION: You must position the processor correctly in the processor socket to avoid damage to the processor.

2. If the release lever on the socket is not fully extended, move it to that position.
3. Orient the alignment notches on the processor with the alignment tabs on the socket.
4. Align the pin-1 corner of the processor with the pin-1 corner of the processor socket, and then place the processor in the processor socket.

   Set the processor lightly in the socket and ensure that the processor is positioned correctly.

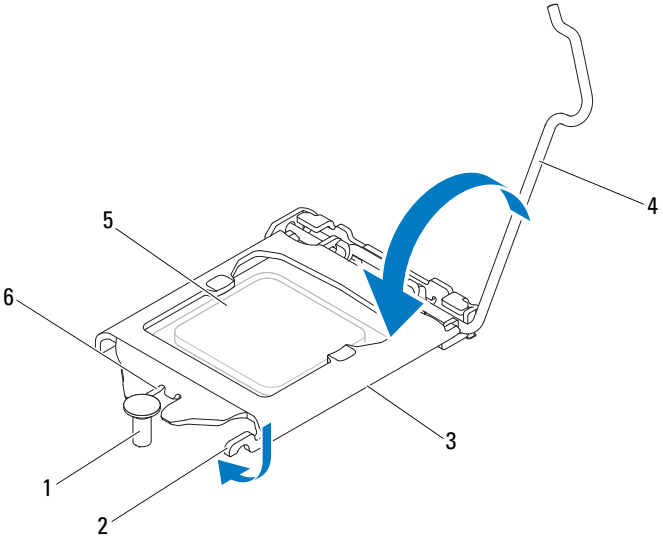


1	socket	2	processor	3	alignment tabs (2)
4	alignment notches (2)	5	processor pin-1 indicator		

CAUTION: Ensure that the processor cover notch is positioned underneath the alignment post.

5 When the processor is fully seated in the socket, close the processor cover.

6 Pivot the release lever down and place it under the tab on the processor cover.



1 alignment post	2 tab	3 processor cover
4 release lever	5 processor	6 processor cover notch

Postrequisites

1 Replace the processor fan and heat-sink assembly. See "Replacing the Processor Fan and Heat-Sink Assembly" on page 71.

2 Replace the computer cover. See "Replacing the Computer Cover" on page 19.

3 Follow the instructions in "After Working Inside Your Computer" on page 11.

17

Coin-Cell Battery

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

WARNING: A battery may explode if installed incorrectly. Replace the battery only with the same or equivalent type. Discard used batteries according to the manufacturer's instructions.

CAUTION: Removing the coin-cell battery resets the BIOS settings to default. It is recommended that you note the BIOS settings before removing the coin-cell battery. See "System Setup" on page 91 for instructions on entering the system setup program.

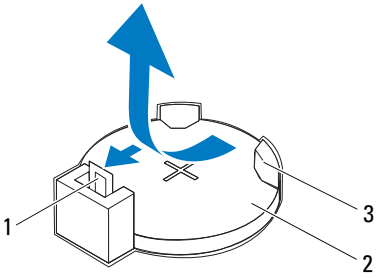
Removing the Coin-Cell Battery

Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

Procedure

1. Locate the battery socket. See "System Board Components" on page 14.
2. Press the battery-release lever away from the battery until the coin-cell battery pops up.



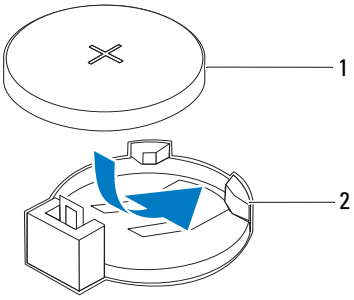
1	battery-release lever	2	coin-cell battery
3	battery socket		

3. Set aside the battery in a secure location.

Replacing the Coin-Cell Battery

Procedure

Insert the battery (CR2032) into the socket with the side labeled "+" facing up, and press down the battery in the socket.



1	coin-cell battery	2	battery socket

Postrequisites

1. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
2. Follow the instructions in "After Working Inside Your Computer" on page 11.
3. Enter the system setup program and set the time and date. See "Entering System Setup" on page 91.
4. Update the BIOS settings with values you may have noted before removing the coin-cell battery. See "Entering System Setup" on page 91.

18

Power Supply

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

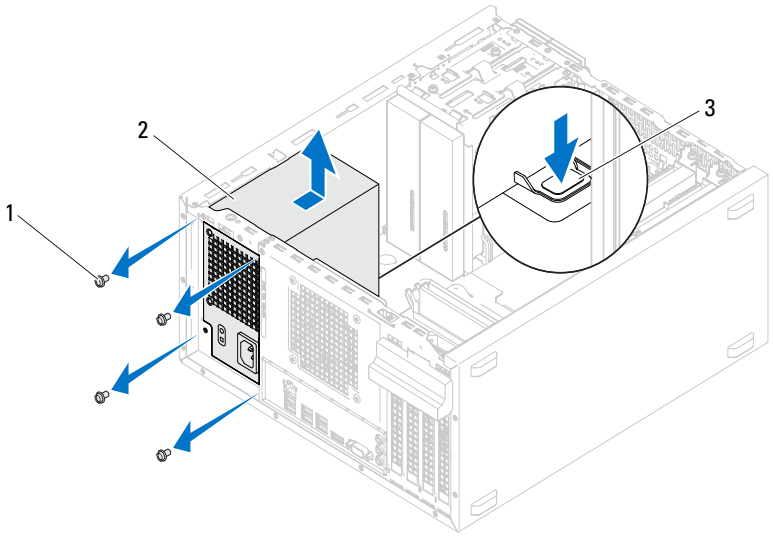
Removing the Power Supply

Prerequisites

Remove the computer cover. See "Removing the Computer Cover" on page 18.

Procedure

1. Disconnect the DC power cables from the system board and the drives. See "System Board Components" on page 14.
2. Remove the screws that secure the power supply to the chassis.
3. Press the power supply clamp to release the power supply from the chassis.
4. Slide and lift the power supply away from the chassis.



1	screws (4)	2	power supply
3	power supply clamp		

Replacing the Power Supply

Procedure

1. Slide the power supply towards the back of the chassis.
2. Align the screw holes on the power supply with the screw holes on the chassis.
3. Replace the screws that secure the power supply to the chassis.
4. Connect the DC power cables to the system board and drives.
   See "System Board Components" on page 14.

Postrequisites

1. Replace the computer cover. See "Replacing the Computer Cover" on page 19.
2. Follow the instructions in "After Working Inside Your Computer" on page 11.

19

System Board

⚠ **WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.**

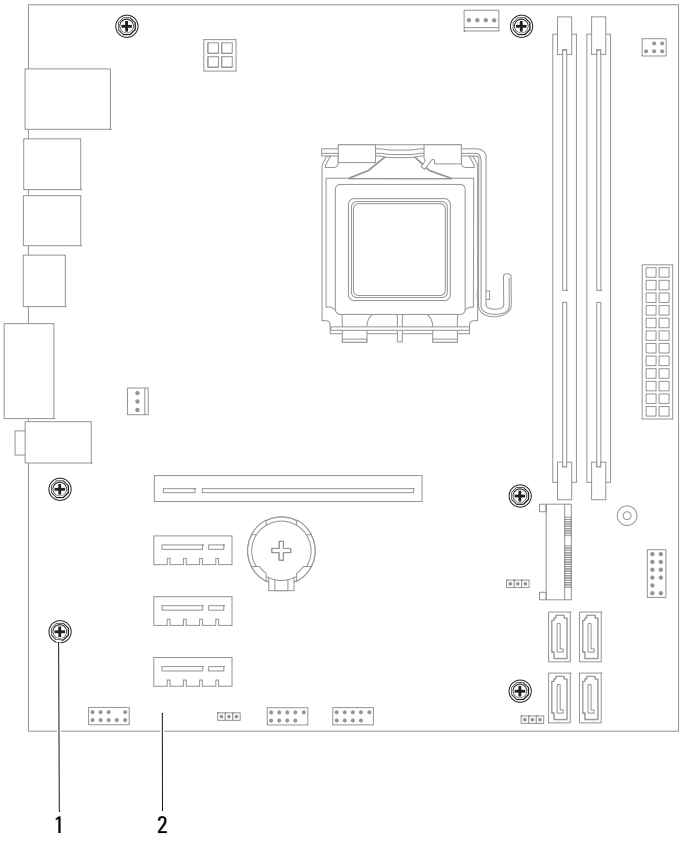
Removing the System Board

Prerequisites

1. Remove the computer cover. See "Removing the Computer Cover" on page 18.
2. Remove the Mini-Card, if applicable. See "Removing the Mini-Card" on page 40.
3. Remove the any PCI-Express cards, if applicable. See "Removing PCI Express Cards" on page 33.
4. Remove the processor fan and heat-sink assembly. See "Removing the Processor Fan and Heat-Sink Assembly" on page 69.
5. Remove the processor. See "Removing the Processor" on page 73.
6. Remove the memory modules. See "Removing the Memory Module(s)" on page 21. Record which memory module is removed from each DIMM slot so that the memory modules can be installed in the same slot after the system board is replaced.

Procedure

1. Disconnect all cables connected to the system board. See "System Board Components" on page 14. Note the routing of all cables as you remove them so that you can re-route them correctly after installing the new system board.
2. Remove the screws that secure the system board to the chassis.



1 screws (6) 2 system board

3. Lift the system board up and out of the chassis.

4 Compare the system board that you removed with the replacement system board to ensure that they are identical.

NOTE: Some components and connectors on the replacement system board may be in different locations compared to the components and connectors on the existing system board.

NOTE: Jumper settings on the replacement system board is preset at the factory.

Replacing the System Board

Procedure

1 Gently place the system board into the chassis and slide it towards the back of the computer.

2 Replace the screws that secure the system board to the chassis.

3 Route and connect the cables that you disconnected from the system board.

NOTE: For information on system board connectors, see "System Board Components" on page 14.

Postrequisites

1 Replace the processor. See "Replacing the Processor" on page 75.

2 Replace the processor fan and heat-sink assembly. See "Replacing the Processor Fan and Heat-Sink Assembly" on page 71.

3 Replace the memory module(s). See "Replacing the Memory Module(s)" on page 22.

4 Replace any PCI-Express cards, if applicable. See "Replacing PCI Express Cards" on page 35.

5 Replace the Mini-Card, if applicable. See "Replacing the Mini-Card" on page 41.

6 Replace the computer cover. See "Replacing the Computer Cover" on page 19.

7 Follow the instructions in "After Working Inside Your Computer" on page 11.

Entering the Service Tag in the BIOS

1. Turn on the computer.
2. Press <F2> during POST to enter the system setup program.
3. Navigate to the main tab and enter the Service Tag in the **Service Tag Input** field.

NOTE: The Service Tag Input field allows you to enter the Service Tag manually only when the Service Tag is absent.

20

System Setup

Overview

Use the system setup to:

- Get information about the hardware installed on your computer, such as the amount of RAM, the size of the hard drive, and so on
- Change the system configuration information
- Set or change a user-selectable option, such as the user password, type of hard drive installed, enabling or disabling base devices, and so on

CAUTION: Unless you are an expert computer user, do not change the settings for this program. Certain changes can make your computer work incorrectly.

NOTE: Before you change system setup, it is recommended that you note the system-setup screen information for future reference.

Entering System Setup

1. Turn on (or restart) your computer.
2. During POST, when the DELL logo is displayed, watch for the F2 prompt to appear and then press <F2> immediately.

   NOTE: The F2 prompt indicates that the keyboard has initialized. This prompt can appear very quickly, so you must watch for it, and then press <F2>. If you press <F2> before the F2 prompt, this keystroke is lost. If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then, turn off your computer and try again. See "Turn Off Your Computer and Connected Devices" on page 9.

System Setup Screens

The system setup screen displays current or changeable configuration information for your computer. Information on the screen is divided into three areas: the **setup item**, active **help screen**, and **key functions**.

<table>
<tr>
<td>Setup Item — This field appears on the left side of the system setup window. The field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features.

Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the Help Screen displays more information about that option and available settings.</td>
<td>Help Screen — This field appears on the right side of the system setup window and contains information about each option listed in the Setup Item. In this field you can view information about your computer and make changes to your current settings.

Press the up- and down-arrow keys to highlight an option. Press <Enter> to make that selection active and return to the Setup Item.

NOTE: Not all settings listed in the Setup Item are changeable.</td>
</tr>
<tr>
<td colspan="2">Key Functions — This field appears below the Help Screen and lists keys and their functions within the active system setup field.</td>
</tr>
</table>

System Setup Options

NOTE: Depending on your computer and installed devices, the items listed in this section may appear, or may not appear exactly as listed.

Main — System Information	
BIOS Revision	Displays the BIOS Revision number
BIOS Build Date	Displays the build date in mm/dd/yyyy format
System Name	Displays system name
System Time	Displays the current time in hh:mm:ss format
System Date	Displays the current date in mm/dd/yyyy format
Service Tag	Displays the Service Tag of the computer when the Service Tag is present
	Displays a field to input the Service Tag manually when the Service Tag is absent
Asset Tag	Displays the asset tag of the computer when the asset tag is present.

Main — Processor Information	
Processor Type	Displays the processor type
Processor ID	Displays the processor ID
Processor Core Count	Displays the processor nominal cores
Processor L1 Cache	Displays the processor L1 cache size
Processor L2 Cache	Displays the processor L2 cache size
Processor L3 Cache	Displays the processor L3 cache size

Main — Memory Information	
Memory Installed	Indicates the amount of memory installed in MB
Memory Running Speed	Indicates the memory speed in MHz
Memory Technology	Indicates the type of installed memory

Main — SATA Information	
SATA 1	
Device Type	Displays the type of device installed on the SATA1 connector
Device ID	Displays the serial number of the device installed
Device Size	Displays the size of the device installed, if the device is a hard drive
SATA 2	
Device Type	Displays the type of device installed on the SATA2 connector
Device ID	Displays the serial number of the device installed
Device Size	Displays the size of the device installed, if the device is a hard drive
SATA 3	
Device Type	Displays the type of device installed on the SATA3 connector
Device ID	Displays the serial number of the device installed
Device Size	Displays the size of the device installed, if the device is a hard drive
SATA 4	
Device Type	Displays the type of device installed on the SATA4 connector
Device ID	Displays the serial number of the device installed
Device Size	Displays the size of the device installed, if the device is a hard drive

Advanced — CPU Feature	
Intel Hyper-Threading Technology	Allows you to enable or disable the Intel Hyper-Threading feature for the processor
	Enabled or Disabled (Enabled by default)
Intel(R) SpeedStep Technology	Allows you to enable or disable the Intel SpeedStep feature for the processor
	Enabled or Disabled (Enabled by default)
Intel(R) Virtualization Technology	Allows you to enable or disable the Intel virtualization feature for the processor
	Enabled or Disabled (Enabled by default)
CPU XD Support	Allows you to enable or disable the execute disable mode for the processor
	Enabled or Disabled (Enabled by default)
Limit CPUID Value	Allows you to limit the maximum value the processor standard CPUID function will support
	Enabled or Disabled (Disabled by default)
Multi Core Support	Allows you to specify if processor will have either one or all cores enabled
	Enabled or Disabled (Enabled by default)
	Enabled - all cores; Disabled - one core only
Intel(R) Turbo Boot Technology	Allows you to enable or disable the Intel turbo boot technology mode for the processor
	Enabled or Disabled (Enabled by default)

Advanced — USB Configuration	
Front USB Ports	Allows you to enable or disable the front USB ports on your computer
	Enabled or Disabled (Enabled by default)
Rear USB Ports	Allows you to enable or disable the rear USB ports on your computer
	Enabled or Disabled (Enabled by default)

Advanced — Onboard Device Configuration	
Onboard Audio Controller	Allows you to enable or disabled the audio controller
	Enabled or Disable (Enabled by default)
SATA Mode	Allows you to configure the operating mode of the integrated hard-drive controller
	ATA Mode; AHCI Mode (AHCI Mode by default)
	CAUTION: Changing the SATA Mode may prevent booting of your operating system.
Onboard LAN Controller	Allows you to enable or disable the onboard LAN controller
	Enabled or Disabled (Enabled by default)
Onboard LAN boot ROM	Allows you to boot your computer from a network
	Enabled or Disabled (Disabled by default)

Boot	
Numlock Key	Allows you to set the status of the Num Lock key during boot
	On or Off (On by default)
Keyboard Errors	Allows you to enable or disable the display of keyboard-related errors during boot
	Report or Do Not Report (Report by default)

Boot *(continued)*	
USB Boot Support	Allows you to enable or disable booting from USB mass storage devices such as hard drive, optical drive, USB key, and so on. Enabled or Disabled (Disabled by default)
Boot Mode	Specifies the boot sequence from the available devices
1st Boot	Displays the first boot device
2nd Boot	Displays the second boot device
3rd Boot	Displays the third boot device
4th Boot	Displays the fourth boot device
5th Boot	Displays the fifth boot device

Power	
Wake Up by Integrated LAN/WLAN	Allow the computer to be powered on by special LAN or wireless LAN signals Enabled or Disabled (Disabled by default)
AC Recovery	Allows you to configure the behavior of your computer after it recovers from a power failure Power Off, Power On, or Last Power State (Power Off by default)
Auto Power On	Allows you to enable or disable the computer from turning on automatically Enabled or Disabled (Disabled by default)
Auto Power On Mode	Allows you to set the computer to turn on automatically every day or on a preselected date; This option can be configured only if the Auto Power On mode is set to Enabled Everyday or Selected Day (Selected Day by default)

Power *(continued)*	
`Auto Power On Date`	Allows you to set the date on which the computer must turn on automatically; This option can be configured only if the Auto Power On mode is set to Enabled 1 to 31 (15 by default)
`Auto Power On Time`	Allows you to set the time at which the computer must turn on automatically; This option can be configured only if the Auto Power On mode is set to Enabled hh:mm:ss (12:30:30 by default)

Security	
`Supervisor Password`	Displays the status of the supervisor password
`User Password`	Displays the status of the user password
`Set Supervisor Password`	Allows you to set, change, or delete the supervisor password
`User Access Level`	Allows you to set access levels to the users No Access, View Only, Limited, or Full Access (Full Access by default) • No Access: Restricts users from editing system setup options • View Only: Allows users to only view system setup options • Limited: Allows users to edit certain system setup options • Full Access: Allows users to edit all system setup options except the Supervisor Password
`Set User Password`	Allows you to set, change, or delete the user password
`Password Check`	Allows you to enable password verification either when you attempt to enter system setup or each time the computer boots Setup or Always (Setup by default)

Exit	
Save Changes and Reset	Allows you to save changes and exit system setup
Discard Changes and Reset	Allows you to discard changes and exit system setup
Load Default	Allows you to restore the default settings

Boot Sequence

This feature allows you to change the boot sequence for devices.

Boot Options

- **USB Floppy** — The computer attempts to boot from the USB floppy drive. If no operating system is on the floppy disk, the computer generates an error message.
- **Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.
- **CD/DVD/CD-RW Drive** — The computer attempts to boot from the CD/DVD/CD-RW drive. If no CD/DVD/CD-RW is in the drive, or if the CD/DVD/CD-RW has no operating system, the computer generates an error message.
- **USB Storage Device** — Insert the memory device into a USB port and restart the computer. When `F12 Boot Options` appears in the lower-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu.

  NOTE: To boot to a USB device, the device must be bootable. To ensure that your device is bootable, check the device documentation.

- **Network** — The computer attempts to boot from the network. If no operating system is found on the network, the computer generates an error message.

  NOTE: To boot from the network, ensure that the `Onboard LAN Boot ROM` option is enabled in system setup. See "System Setup" on page 91.

Changing Boot Sequence for the Current Boot

You can use this feature to change the current boot sequence, for example, to boot from the CD/DVD/CD-RW drive to run Dell Diagnostics from the *Drivers and Utilities* disc. On completion of the diagnostic tests, the previous boot sequence is restored.

1. If you are booting from a USB device, connect the USB device to a USB port.
2. Turn on (or restart) your computer.
3. When `F2 Setup, F12 Boot Options` appears in the lower-right corner of the screen, press <F12>.

   NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop. Then, shut down your computer and try again.

   The **Boot Device Menu** appears, listing all available boot devices.
4. On the **Boot Device Menu** choose the device you want to boot from.

   For example, if you are booting to a USB memory key, highlight **USB Storage Device** and press <Enter>.

   NOTE: To boot to a USB device, the device must be bootable. To ensure your device is bootable, check the device documentation.

Changing Boot Sequence for Future Boots

1. Enter system setup. See "Entering System Setup" on page 91.
2. Use the arrow keys to highlight the **Boot** menu option and press <Enter> to access the menu.

   NOTE: Write down your current boot sequence in case you want to restore it.
3. Press the up- and down-arrow keys to move through the list of devices.
4. Press plus (+) or minus (–) to change the boot priority of the device.

Clearing Forgotten Passwords

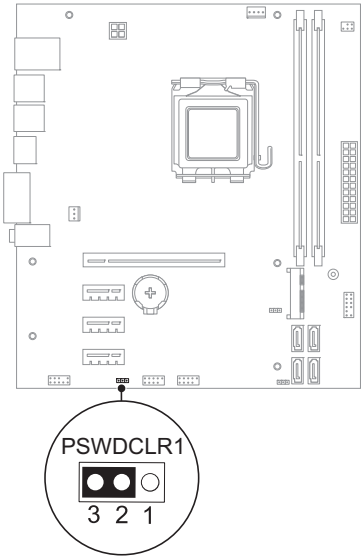
WARNING: Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer.

WARNING: The computer must be disconnected from the electrical outlet to clear the password setting.

CAUTION: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

1. Follow the instructions in "Before You Begin" on page 9.
2. Remove the computer cover. See "Removing the Computer Cover" on page 18.
3. Locate the 3-pin password reset jumper (PSWDCLR1) on the system board. See "System Board Components" on page 14.
4. Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.



5 Turn on the computer to clear the password.

6 Turn off the computer and disconnect your computer and all attached devices from their electrical outlets.

7 Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3 to enable the password feature.

8 Replace the computer cover. See "Replacing the Computer Cover" on page 19.

9 Connect your computer and devices to electrical outlets and turn them on.

Clearing CMOS Passwords

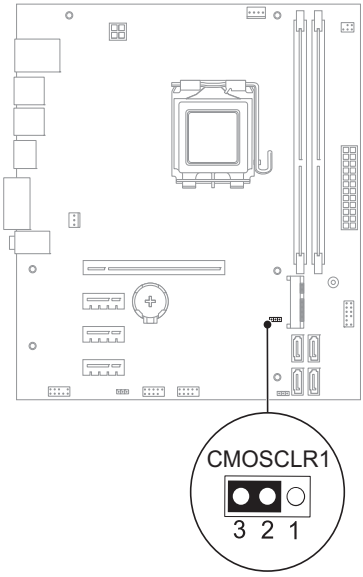
WARNING: Before you begin any of the procedures in this section, follow the safety instructions that shipped with your computer.

WARNING: The computer must be disconnected from the electrical outlet to clear the password setting.

CAUTION: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

1. Follow the instructions in "Before You Begin" on page 9.
2. Remove the computer cover. See "Removing the Computer Cover" on page 18.
3. Locate the 3-pin CMOS reset jumper (CMOSCLR1) on the system board. See "System Board Components" on page 14.
4. Remove the 2-pin jumper plug from pins 2 and 3 and fix it on pins 1 and 2.



5 Wait for approximately five seconds to clear the CMOS setting.

6 Remove the 2-pin jumper plug from pins 1 and 2 and replace it on pins 2 and 3.

7 Replace the computer cover. See "Replacing the Computer Cover" on page 19.

8 Connect your computer and devices to electrical outlets and turn them on.

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Flashing the BIOS

The BIOS may require flashing when an update is available or when replacing the system board. To flash the BIOS:

1. Turn on the computer.
2. Go to **support.dell.com/support/downloads**.
3. Locate the BIOS update file for your computer:

   NOTE: The Service Tag for your computer is located on a label at the bottom of your computer. For more information, see the Quick Start Guide that shipped with your computer.

   If you have your computer's Service Tag or Express Service Code:

   a. Enter your computer's Service Tag or Express Service Code in the **Service Tag or Express Service Code** field.

   b. Click **Submit** and proceed to step 4.

   If you do not have your computer's Service Tag or Express Service Code:

   a. Select one of the following options:

      - **Automatically detect my Service Tag for me**
      - **Choose from My Products and Services List**
      - **Choose from a list of all Dell products**

   b. Click **Continue** and follow the instructions on the screen.
4. A list of results appears on the screen. Click **BIOS**.
5. Click **Download File** to download the latest BIOS file.
6. In the **Please select your download method below** window, click **For Single File Download via Browser**, and then click **Download Now.**
7. In the **Save As** window, select an appropriate location to download the file on your computer.
8. If the **Download Complete** window appears, click **Close**.
9. Navigate to the folder where you downloaded the BIOS update file. The file icon appears in the folder and is titled the same as the downloaded BIOS update file.
10. Double-click the BIOS update file icon and follow the instructions that appear on the screen.

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Specifications

To learn about the features and advanced options available on your computer, see **Specifications** at **support.dell.com/manuals**